



Interactive comment on “Lava flow hazard map of Piton de la Fournaise volcano” by Magdalena Oryaëlle Chevrel et al.

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We acknowledge these meticulous reviews as they improved the manuscript organization and clarify many aspects of the methods as well as the results. Also, they allowed us to deepen the discussion by pointing out the limitations and the strengths of our approach, as well as our crucial interpretation of hazard maps. Reviewer 2 (Hannah Dietterich) raised a large number of forward questions that are totally justified and very interesting. For example, she asked if other numerical models were used, she suggested to incorporate time (probability of inundation at a location over a given time interval), as opposed to just a conditional probability for a future event, or suggested to provide quantification of probabilities in a given area (for example: what is the prob-

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ability that the road will be cut), etc... Applying all these suggestions, would require significant additional data and great lengthening of the article, as well as data that are outside the scope of this study. We find more appropriate and valuable for our study to not add more data here. This will ensure our article to be concise (already at length) and accessible for authorities and non-specialist as well. It is very important to recall that there are limited studies (if any) on lava flow hazard map at Piton de la Fournaise, in comparison to other volcanic centers such as Etna, or Hawaii where numerous articles have already been published on the subject. Our aim in this article is to provide a first version of a hazard map of Piton de la Fournaise, so it may serve as a reference study for future specific research topics on Piton de la Fournaise such as testing other methods to compute the hazard map or provide probability of inundation as function of time etc. . . (that would fulfill the reviewer's suggestions). Also through this article we aim at providing a clear article that explains our rather simple approach for the civil protection and authorities to understand it and to use it as support for potential land use planning and management. As mentioned in the last section of the discussion: “The presented map is thus also intended to aid and guide stakeholders in developing effective mitigation and land use plans that also take into account the main volcanic hazard, with the caveat that our maps are for a “typical” effusive event.”

We hope that the article in this new shape and improved content is now suitable for publication given the changes we provided. All major comments were answered and the text improved as required. These changes include new numbering of the sections by gathering methods and data and providing a clearer results section and a longer and deeper discussion. Figure 5 has been improved. Figure 7 has been improved as recommended by both the reviewers and is now described in more details in the results section and well discussed in the discussion section. A new figure (figure 8) was added to support discussion. All minor corrections were done.

See attached pdf

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Please also note the supplement to this comment:
<https://nhess.copernicus.org/preprints/nhess-2020-394/nhess-2020-394-AC2-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-394>, 2020.